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2014 Symposium Overview

Cedarville University

Fifth Annual

Research + Scholarship SYMPOSIUM

Cedarville University: *Inspiring Greatness*

April 16, 2014

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PODIUM PRESENTATIONS

College of Arts and Sciences

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Nikolaus Foulkrod	Undergraduate Student	English, Literature, and Modern Languages	Christian Themes in German Folk Literature	Nikolaus Foulkrod, Grant Friedrich, Jen Johnson, Nathaniel Burrell
	This research attempts to locate and identify Christian motifs in German fairy tales based on the research of Ronald Murphy in *The Owl, the Raven and the Dove* (2002). We selected 12 stories from the famous book by the Brothers Grimm, *Kinder und Haus Märchen*, and analyzed them in order to find direct and indirect Christian values and morals. The Germanic culture is historically grounded in Christian ideology; therefore, folk tales throughout the centuries included Christian themes as a means of infusing the culture with biblical concepts, and to serve as a conduit for teaching Christian values. This is apparent in the fairy tales that we analyzed. Our research reveals various and varied Christian and moral motifs.			
Brandon Bellanti	Undergraduate Student	Music and Worship	Sing to the Lord a New Song: John Calvin and the Spiritual Discipline of Metrical Psalmody	Brandon Bellanti
	The purpose of this essay is to evaluate the way that psalmody – specifically metrical psalmody – serves as a sort of spiritual discipline. In other words, this essay seeks to demonstrate how the singing of Psalms can be a tool to aid in spiritual growth. Much of the research for this essay focuses on the theological writings of the Protestant reformer John Calvin, as well as the way in which he incorporated metrical psalmody into his liturgical framework. The research also comprises primary writings from Aristotle, Plato, Saint John Chrysostom, Saint Basil, and Saint Augustine, all of whom influenced Calvin's own philosophy regarding the use of art, music, and psalmody in worship. Additional areas examined in this research include the historical musical development of psalmody and the collection and arrangement of metrical psalms into psalters. For reference, specific examples of metrical Psalms and Psalters have been added. These additional areas and examples help to give a more holistic understanding of the nature of metrical psalmody, and they help to show how it may accurately be considered a spiritual discipline.			
Kimberly Reitsma	Undergraduate Student	Music and Worship	A New Approach: The Feminist Musicology Studies of Susan McClary and Marcia J. Citron	Kimberly Reitsma
	One of the currently prevalent analytic approaches in academia is feminist theory and criticism. Its combination with musicology has influenced the field for the past four decades. The goal of the new approach, loosely termed "feminist musicology," was to discover, analyze, discuss, and promote the representation of women and the "feminine" essence in various disciplines of music. Today, feminist musicology is highly researched, research is published in books and journals, and scholarly papers are presented at various musicological conferences around the world. This new approach introduces the ideologies of feminism to the study of music. Susan McClary and Marcia J. Citron are two musicologists who were influenced by these ideologies and have guided the musicological world in this direction of feminist musicology Susan McClary was born in 1946, received her doctorate from Harvard in 1976, and currently teaches at Case Western Reserve University in Cleveland, Ohio. Marcia J. Citron was born in 1945, received her doctorate from University of North Carolina in 1971, and currently teaches at Rice University in Houston, Texas. Both of these musicologists have made significant contributions to the emerging field of feminist musicology. Both researched the ideas of gender musical construction within musical narratives, music as a gendered discourse, and historical and social factors that affected women in music. While they researched with similar methodologies, the subject of their personal research has differed This area of musicology has become vitally important as today's musicians increasingly evaluate the effects of social movements upon the music and music scholarship of a particular time and culture. This investigation goes beyond music itself by including other disciplines, such as sociology and psychology, to further understand musicology. The path of developing the field of feminist musicology has been challenging; however, McClary and Citron are persistent pioneers. As scholars, they have met considerable resistance, both outside the feminist movement and within it. Overall, Susan McClary and Marcia J. Citron have significantly expanded the scope of musicology through their application of feminist theory.			
Anna Raquet	Undergraduate Student	Music and Worship	You Are What You Hear– The Formative Powers of Music	Anna Raquet
	Our choice of music defines what we become. Adults often perceive the musical listening habits of the young as extreme, excusing them because they perceive their choice of music as simply another aspect of their rebellion against authority or society. However, this connection between character, interests, lifestyle, and the music of choice should be extended to include people of every age. Small children and adults are just as affected by the music to which they listen. My purpose in writing this paper was to find evidence for a connection between the music we hear and the people we become. I was especially interested in what ancient scholars such as Augustine, Plato, and other Greek philosophers thought on the issue. I examined 20 books and articles ranging from the ancient Greeks and their views on music to contemporary authors discussing music and its relationship to psychology or humanism. My research indicated that the notion that music changes its listeners is nothing new, but that the correlation between music and moral formation has an ancient history. Even scholars as far back as Plato discussed what sorts of music were appropriate for the young in order to make them into proper members of society. Cultural and political movements rarely happen without music playing a key role in motivating and uniting a group of people into a powerful unit, and the church has certainly utilized the emotional and influential aspects of music in its traditions. This paper examines historical evidence for music as a character-forming force, and discusses how this fact should impact our musical listening choices.			
Alexandria Martella	Undergraduate Student	Music and Worship	Sugar Plums, Swans, and Sleeping Beauties: A Consideration of Tchaikovsky and His Ballets	Alexandria Martella
	This presentation concerns the life of Pyotr Ilyich Tchaikovsky and his ballet music. I have been intrigued to find out what in his world prompted him to write this music. Some of my research has proven that Russia was a very backward country compared to the rest of Europe during the 19th century. Ballet was mainly a form of entertainment for the elite, especially the imperial court. This affected Tchaikovsky and his productions of these ballets; it seems that ballet was more of a Western practice picked up by Russians, and Tchaikovsky, through his ballets, helped in the modernization of Russia. I have also found that some of my presuppositions about the man and his ballet music are false. Not every ballet he wrote for was a hit instantaneously. In fact, Tchaikovsky only saw one of his ballets live up to its full potential. It's also interesting to find that while Tchaikovsky loved composing in all sorts of styles, he didn't consider his ballets his best works. While they probably remain the most popular of his surviving works today, they didn't start out quite as popular. Paper Introduction Excerpt: "Tchaikovsky was living in a nation severely behind the times, with a royal ballet not at all like we picture Russian ballet today. It was this world that shaped the creation of his masterful ballet music. If we take off the foggy American lenses and peer into Tchaikovsky's world, we see a man with extraordinary creative talent who only saw one ballet realized to its full potential. There are a variety of questions to ask concerning why they weren't as fully appreciated in his lifetime; however, the main question is why did this man write ballet music in the first place? If ballet music wasn't as flowery as it all seems, what was the point? Tchaikovsky wrote ballet music to appease the imperial court, for financial gain, for the desire to become more Western, and for the joy of composing the music itself (sometimes)."			

PODIUM PRESENTATIONS *(continued)*

College of Arts and Sciences *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Alyssa Griffith	Undergraduate Student	Music and Worship	Górecki's Symphony No. 3, Op. 36 "Sorrowful Songs"	Alyssa Griffith
	The experience of listening to Górecki's Symphony no. 3, op. 36 *Sorrowful Songs* is one that is not easily forgotten. It is not only musically captivating, but also historically fascinating. After its premiere in 1977, Górecki's piece captivated listeners across the globe as it became a cultural phenomenon in both Europe and America. The music was a stunning success in both the Classical and popular cultures. What is it about the music that is so captivating? How did the trending, popular thoughts compare to Górecki's original ideas and compositional motives? What actually inspired this piece? By looking at the composition and premise of each movement, I am going to introduce how the piece was written around the theme of maternal love and separation of mother and child. The Third Symphony was heavily influenced by Górecki's personal past, but also by his Catholic beliefs and by Polish history. The separate texts to this three-movement piece deal individually with a mother's lament over her son's departure, the Virgin Mary's grief at her Son's death, and finally the words of an incarcerated prison girl to her mother. Because of the setting from which the third text was drawn, and because of Górecki's Polish history and experiences in the post-holocaust world, many people have interpreted this to be a "war piece" which avenges the sufferers of the Holocaust. According to Górecki's, this piece is a lament- it expresses a profound sense of grief that, arguably, cannot accurately be expressed with words. Górecki's used his music to confront, mourn, and express his pain and the pain of many other people. By finding primary sources, such as interviews of Henryk Górecki's, and by looking at the scholarly books and journals by Luke B. Howard, Adrian Thomas, and other scholars of Polish avant-garde music, I hope to properly understand and express the intentions Górecki's wished to convey by writing *The Symphony of Sorrowful Songs*.			
Jeremy Witt	Undergraduate Student	Music and Worship	"We Don't Need No Instrumentation": The Educational Benefits of Pop A Cappella	Jeremy Witt
	A cappella singing has been a standard in American vocal music for many decades. The first a cappella choir in America is said to be the St. Olaf Choir founded by F. Melius Christiansen. As we progressed through the 19th century, many other a cappella ensembles formed, such as the glee club. The start of collegiate a cappella is most often credited to the Whiffenpoofs from Yale. They began in 1909 and are still running today. Also, at this time we began to see the barbershop quartet take form and gain popularity across the country. It was best known for tight harmonies and fun choreographed movements throughout the songs. Barbershop then brought about doo-wop groups with song standards such as *The Longest Time*, *In the Still of the Nite*, and *It's So Hard to Say Goodbye to Yesterday*. This then led into the boom of a cappella on college campuses and the contemporary collegiate a cappella group. In 1980 there were approximately 110 active groups. By the end of the 1980s, at least 226 groups existed. Within the next decade, 313 new groups had begun—more in the period 1990–99 than in the prior 81 years. Collegiate a cappella was increasing rather rapidly through much of the nineties and was beginning to spread out past the elite universities. Throughout the history of a cappella music in the United States and the a cappella craze across college campuses, this style of singing has become part of many high school choral curriculums. Today you will find many high schools with a cappella choirs, barbershop groups, and maybe even doo-wop groups. However, the a cappella craze of today on college campuses is the "Contemporary (or pop) a cappella group." This type of group is just a continuation of the history of a cappella with its focus on popular music. The use of popular music in the school classroom is not, however, a widely accepted practice. Contemporary (pop) a cappella is a beneficial and educational performance experience for the school curriculum.			
Jacob Tudor	Undergraduate Student	Music and Worship	The Sound of the Silence: Music in World War II Concentration Camps	Jacob Tudor
	Music was a constant and crucial component of everyday life in World War II concentration camps. In the concentration camps, there were many genres of music performed and written by victims of German brutality. The Germans used the power of music in the concentration camps as a way to degrade and torture the victims. On the other hand, World War II concentration camp victims used music as a response of the perception to the reality of daily life. It was also used as a coping mechanism and a way to provide the strength to survive on a day-to-day basis. Furthermore, music was key to Jewish cultural survival during the war. Music also demonstrated the victims' will to create that could not be destroyed. Finally, music served as a reminder of one's humanity to the concentration camp victims.			
Michael Wood	Undergraduate Student	Music and Worship	A Somewhat Silent Protest: How Dmitri Shostakovich Used His Music, Not His Words, To Rebel Against The Soviet Government	Michael Wood
	Dmitri Shostakovich composed in an environment that was extremely hostile toward artists, especially those that were innovative. Shostakovich was denounced by the Soviet government and had to be cautious with his compositions. If the government disapproved of his work, they could have killed him, as they did other artists. Shostakovich obviously had to keep his opinions to himself for fear of being killed. Although he had to keep his unfavorable views of the Soviet government private, he found ways to make bold, rebellious statements through his music. This paper will seek to show several pieces in which Shostakovich demonstrated his disapproval of the Soviet government. The main pieces that will be examined are his fifth, ninth, and 10th symphonies, as well as his lesser-known Anti-Formalist Rayok.			
Kevin Hicks	Undergraduate Student	Music and Worship	What Are the Hills Really Alive With?: Spectacle Versus Narrative Driven Musical Theatre	Kevin Hicks
	American musical theatre is known for its entertaining qualities, but what holds the audience's attention to stick around for the second act? Is it the dance numbers, the fancy lighting, and the spectacular numbers or is it the story and the characters? Musical theatre always uses a combination of the two elements, but one of two tends to drive an individual musical forward and engage the audience's attention. The conflict of emphasizing spectacle or narrative can bee seen initially at musical theatre's conception all the way down to recent shows written by Webber and Sondheim. Spectacle can be understood as the dances, musical numbers, and effects in a show that are used to dazzle the audience. Narrative, on the other hand, is the use of storyline and character development to engage the audience. Through its history, musical theatre has combined these two forces and each show places a higher emphasis on one or the other.			
Andrew McFarlane	Undergraduate Student	Music and Worship	War and the Glory of the Human Spirit: the Context and Content of Prokofiev's 5th Symphony	Andrew McFarlane
	Prokofiev's 5th Symphony is considered by many to be the climactic work of his life. The work, composed during World War II, expressed Prokofiev's vision of Man– free and happy, pure and noble– which largely contrasted much of the public's view in the midst of such turmoil on earth. This study will address Prokofiev's environment that surrounded, techniques that produced, and vision that formed his fifth symphony. Specifically, it will ask: what was the historical and personal context of its composition and first performance, and how did Prokofiev use his music to express this "free and happy man"? Providing both a brief history of Prokofiev's life and the context of wartime Russia as well as an analysis of its first movement, Andante, this study will show that Prokofiev's work is significantly related to his historical context, technical knowledge, and vision of the "free and happy man" in the midst of worldwide conflict. These findings emphasize the importance of studying a work's context, technique, and vision to understand and appreciate the fullness of a composer's work.			

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College of Health Professions

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Nancy Montgomery	Undergraduate Student	Social Work	Restorative Justice in Post-Conflict Areas	Nancy Montgomery, Hillary Hook, Hilary Murphy
	This presentation sought to review the literature in regards to understanding international restorative justice efforts in conflict-prone areas. After outlining a definition of restorative justice, we explored its implementation in three different countries. First, we examined the historic precedence of indigenous sentencing courts in Australia. Second, we looked at current measures in Northern Ireland and their effectiveness. Third, we offered a predictive outline for the potential work in South Sudan. These case studies showed the past, present, and future of restorative justice. With this knowledge we hoped that people would better understand the efficacy of restorative justice and recognize the role it played in conflict resolution.			
Rachel Kulken	Undergraduate Student	Social Work	Global Care of Orphaned and Vulnerable Children	Rachel Kuiken, Lauren Gamberde, Meredith Wood,
	Care for orphaned and vulnerable children living in poverty is a widespread concern affecting millions worldwide. This presentation will focus on the current literature surrounding physical, emotional, and environmental care in the following countries: Mozambique, the USA and the Philippines. There is a correlation among these three countries involving the lack of food, health care, and education. There will be an emphasis on the national policies implemented within each country that seek to ensure sustainability and quality in care. This presentation will also focus on the positive change that is being fulfilled by both government and nongovernment organizations passionate about the issue in each specific country. Some of these agencies include Naomi's Heart Mission, The Creche and local organizations in Ohio.			
Bethany Green	Undergraduate Student	Social Work	Bullying of the LGBTQ Community	Bethany Green, Alicia McLeod, Ashlynn Kelly
	Our group did a literature review and identified that bullying of the lesbian, gay, bisexual, transgender and questioning populations occurs worldwide and is becoming a more prominent global issue. Our group researched and identified bullying in the United States, South Africa, Uganda, and Russia. We address these specific countries because of the attention that they have recently received in the media in regards to treatment of people who identify as LGBTQ. We examined this topic and, explored the bio-psycho-social effects of LGBTQ bullying and provided different ways that people can address the problem of bullying of the LGBTQ community through venues such as education and advocating for policy change in the previously stated countries. We also provide information regarding different organizations in the secular and Christian community that are addressing bullying of the LGBTQ.			
Hayley Wolfe	Undergraduate Student	Social Work	Prison Abuse and Mental Health	Hayley Wolfe, Shelby Haas, Candace Olley
	Abuse among mentally ill inmates is a relevant issue in prison systems worldwide. This presentation will focus on the pervasiveness and severity of this abuse in the U.S. and abroad. Pertinent statistics regarding the prevalence of abuse among the mentally ill in prison systems, as well as the obstacles to obtaining such statistics will be presented. Following the major deinstitutionalization of mental hospitals in the 1970s, the mentally ill inmate population has seen exponential increase in the United States. Abuse statistics of the mentally ill in United Kingdom prisons will also be presented and analyzed, including concerns in prison staff training, support, and supervision. A large portion of the presentation will also focus on the discontinuity between current Bureau of Prisons legislation and the current state of affairs in the American prison system– highlighting problems with maximum security exploitation, disproportional staff-to-inmate ratios, and police brutality resulting from a lack of education. In closing, opportunities for advocacy will be explored.			
Emily Puffer	Undergraduate Student	Social Work	Prison Abuse and Mental Health	Hayley Wolfe, Shelby Haas, Candace Olley
	Abuse among mentally ill inmates is a relevant issue in prison systems worldwide. This presentation will focus on the pervasiveness and severity of this abuse in the U.S. and abroad. Pertinent statistics regarding the prevalence of abuse among the mentally ill in prison systems, as well as the obstacles to obtaining such statistics, will be presented. Following the major deinstitutionalization of mental hospitals in the 1970s, the mentally ill inmate population has seen exponential increase in the United States. Abuse statistics of the mentally ill in United Kingdom prisons will also be presented and analyzed, including concerns in prison staff training, support, and supervision. A large portion of the presentation will also focus on the discontinuity between current Bureau of Prisons legislation and the current state of affairs in the American prison system– highlighting problems with maximum security exploitation, disproportional staff-to-inmate ratios, and police brutality resulting from a lack of education. In closing, opportunities for advocacy will be explored.			
Daniel Nelson	Undergraduate Student	Psychology	The Political Affiliation of Cedarville University	Daniel Nelson
	There is little question that higher education within the United States is largely perceived as a liberal organ. Indeed, within both the professorate and the student body, the liberal demographic has maintained a steady and often dramatic majority. A modest liberalization effect has been found among students across the nation, and those within the social sciences have exhibited greater-than-average liberal-to-conservative ratios. Stemming from both stereotypes and general data, many politically conservative affiliates have trumpeted their political ideologues as the alienated, maligned, and even persecuted minority. From accusations of liberal indoctrination to the dismissal of opposing views, many conservatives have heatedly spoken against the nationwide institution of higher learning. Naturally, like-individuals associate with one another, and quite predictably, collegiate learning has revealed an at times compact conservative minority within specific colleges and universities, even to the point of reaching a prominent majority within these few institutions. It was hypothesized that Cedarville University, consistent with data from 2004, would reveal a strong conservative majority. While results upon polling were relatively consistent with this hypothesis, the demographic spread was unexpectedly consistent with results revealed in the 2004 original study. Moreover, the recent data revealed several statistically significant trends that prompted multiple hypotheses. A biannual survey is encouraged for future research in order to comprehensively examine the political affiliation trends of a unique student body.			
Ryan Beach	Undergraduate Student	Business Administration	Is Fractional Reserve Banking Necessarily Immoral	Ryan Beach, Jeffrey Haymond
	Modern central banking allows banks to initiate new money creation while holding only a small fraction as cash reserves for possible deposit withdrawal. When extended throughout the banking system, the process of "multiple deposit expansion" leads to inflation. Christian thought has historically been critical of fractional reserve banking, not only because of the inflationary impact, but the impossibility of meeting all legal requirements: when money is loaned out, it cannot at the same time be redeemed as a demand deposit. Given the explicit legal promise to return demand deposits and the impossibility to do for all depositors, Christian analysis has condemned fractional reserve banking as inherently fraudulent. But is this necessarily so? This article will review fractional reserve banking and other institutional arrangements that lead to bank runs and inflation (legal tender laws, central banking, etc.) to determine if fractional reserve banking by itself is necessarily immoral. The bulk of the paper will survey existing scholarly thought, while our summary analysis will ask the question "are there any circumstances where fractional reserve banking could be morally justified?"			

POSTER PRESENTATIONS

College of Arts and Sciences

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Marian Bhajjan	Undergraduate Student	Science and Mathematics	The Chemorepellent, Netrin-1, Appears to Signal Through a Tyrosine Kinase in Tetrahymena Thermophila	Marian Bhajjan, Anna Hurtubise, David Petroff, Cambria Puffenberg, Stephanie Song, Heather Kuruvilla
	Netrin-1 is a pleiotropic peptide signaling molecule. Its most well-known role in vertebrate development is neuronal guidance. Depending upon the cell type and signal concentration gradient, netrin-1 may serve either as a chemoattractant, causing formation of axonal growth cones, or as a chemorepellent, causing growth cone collapse within the axon. Netrin-1 can bind to at least two types of receptors, and uses a variety of signaling proteins to convey its message. In some vertebrate cell types, the netrin-1 signal is G-protein mediated, while in other cell types, netrin signaling requires a tyrosine kinase or some other combination of kinases in order to signal. Tetrahymena thermophila are free-living, eukaryotic cells that can respond to chemoattractants and chemorepellents by moving toward attractants and away from repellents. By studying the behavior of these organisms, we have found that netrin-1 acts as a chemorepellent in T. thermophila. Response to netrin-1 is concentration dependent, with an EC₁₀₀ of approximately 1 micromolar, and an EC₅₀ of approximately 10 pM. Netrin-1 avoidance may be effectively eliminated by the addition of the broad-spectrum tyrosine kinase inhibitor, genistein, to the behavioral assay. The IC₁₀₀of genistein was approximately 75 micrograms/ml, while the IC₅₀of this compound was near 50 micrograms/ml. G-protein inhibitors, calcium chelators, and a number of other pharmacological inhibitors had no effect on netrin-1 signaling in this organism. These data show that netrin-1 is a chemorepellent in Tetrahymena thermophila and that netrin signaling appears to implicate a tyrosine kinase in this organism. Further studies will help us to determine whether genistein is specifically acting upon a tyrosine kinase pathway or whether the inhibition is occurring via some other genistein-mediated effect.			
Thomas Rice	Faculty	Science and Mathematics	Progressive Assessment of Lake Depths in Cedar Lake	Thomas Rice, Samuel Rice
	Cedar Lake on the campus of Cedarville University (CU) has a history that probably does not match what the original developers had envisioned. At present, the lake is the visual focal point of the campus, and people often ask about its physical characteristics. The questioned characteristics include, but are not limited to, water depth, bottom configuration, water volume, drainage area that feeds it, rate of infilling, perimeter length, and lake surface area. This study considers the issues of potential changes in water depth, bottom configuration, and lake volume over an extended period of time, and further considers what to use as baseline data to start a long-term assessment. Changes to water depth, bottom configuration, and water volume in any lake are most often attributed to sediment infilling unless observed purposeful alteration by man is known to have occurred. A comparison of changes in total water volume of Cedar Lake will probably be the most valuable means by which the rate of infilling can be assessed. In the fall of 2012 the CU Environmental Geology class did an assignment that produced a bottom-contour map of Cedar Lake. Although the depth and position measurement techniques were somewhat crude, the end result was a map that seemed to be a very reasonable depiction on the lake bottom configuration. With certain refinements to the field techniques and the equipment, a second map will be produced in the fall of 2014. After that, a new map would be created every other year in the fall from new field data. The project should continue for a minimum of 10 years. A software package called Surfer was used in 2012 and will continue to be used to produce the contour maps of the lake and to do the volume calculations. Ultimately, if techniques and assessments are deemed adequate, then conclusions can be made regarding the infilling rate of the lake. Rate-of-infilling is a condition that needs to be understood in order to address both the short- and long-term health of the lake. The economic consequences may be minor or significant depending, on the findings.			
Anthony Baglio	Undergraduate Student	Science and Mathematics	Differential regulation of Dynamin-related Protein 1 Splice Variants by Membrane Adaptors	Anthony Baglio
	We begin the first biochemical examination of the multiple splice variants of human Dynamin-related protein 1 (Drp1), a GTPase involved in mitochondrial fission. While eight such variants, generated through alternative mRNA splicing, have been identified, here we focus on two: the shortest variant (Short) which is ubiquitous, and the longest (Long), which piqued our interest since Drp1 Long is expressed exclusively in neurons. We now establish the various functional differences between these two Drp1 splice variants. Our data reveal that whereas Drp1 Short exhibits constitutively high GTPase activity, Drp1 Long does not. Interestingly, mitochondrial outer membrane proteins, mitochondrial fission protein 1 (Fis1) and mitochondrial fission factor (Mff) that putatively function as receptors for Drp1 differentially regulate the enzymatic activity of the two splice variants. It is possible that the roles of Mff and Fis1, which have conflicting reports in the literature, may vary across Drp1 splice variants and thus be tissue specific. To gain a better understanding of the role of such Drp1 effectors, we focus primarily on Mff, as it has the strongest observed effect on Drp1 enzymatic activity, and probe its mechanism of action using a variety of biochemical and biophysical tools.			
Katherine Guffey	Undergraduate Student	Science and Mathematics	Brain Death in Medical Ethics	Katherine Guffey
	Researchers are continually discovering new medicinal therapies. Technology is advancing at an unprecedented rate, and modern medicine has turned into an expansive multi-trillion dollar enterprise. New tools such as ventilators and feeding tubes give doctors the ability to extend a person's life beyond its natural limits. Conditions which used to kill 100% of victims no longer cause as many deaths per year. While these medical technologies bring about the benefit of longer human lives, they have created a new realm of ethical dilemmas. As the old adage goes, "With great power comes great responsibility." If we have so much power, we must know how and when we can apply it. Two recent medical cases highlight the need to establish ethical rules by which we may govern medical practice. In the first case, 14-weeks-pregnant Marlise Muñoz was declared brain dead and placed on life support. State laws mandated that the physicians keep her on life support to protect the fetus, despite its nonviable status and the Muñoz family's protests. Physicians eventually removed Muñoz from life support, allowing both her and her baby to die completely. In the second case, 22-weeks-pregnant Robyn Benson was also declared brain dead and placed on life support. Benson's child was delivered successfully at 34 weeks, and physicians removed Benson from life support the following day, allowing her to die completely. These two cases present us with a difficult question: Is it ever morally permissible to keep an irreversibly damaged corpse on life support? I will argue that it is morally permissible to perfuse a corpse when doing so would give life to another human being. I will develop this idea by defining death, by evaluating our responsibilities to the dead, and by appealing to medical principlism to critique these two cases. My findings give physicians an ethical standard for clinical situations involving brain dead patients.			

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POSTER PRESENTATIONS

College of Arts and Sciences *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Matthew Ingle	Faculty	Science and Mathematics	Does Baylisascaris Procyonis Phylogeney Correlate With That of the Raccoon (Procyon lotor)	Matthew Ingle, Stephen Dunbar, Jaynee Bartsch, Kyle Culbertson, Taylor Fulton, Katherine Guffey, Aubrey Juris, Ashlie Nolan, Dan Nordquist, Carrie Rowlands, Joshua Sitler
	Baylisacaris procyonis, commonly known as the raccoon roundworm, is a parasite that inhabits the small intestine of the North American raccoon (Procyon lotor). Although humans do not typically become the definitive host, humans can become infected through handling soil containing eggs. B. procyonis can induce serious health complications in cases of human infection, including degenerative retinal and behavioral changes, coma, and even death. High prevalence of B. procyonis in a raccoon population increases the probability of transference to human hosts. In our study, we analyzed the genetic structure of B. procyonis harvested from raccoons of southwestern Ohio, and compared this to the genetic structure of the raccoons they inhabited. It is our hypothesis that the genetic structuring of the roundworms is the same as the genetic structuring of the raccoons. We isolated DNA from the roundworms using the method outlined in the DNA Minikit (Qiagen). Our research team isolated DNA from each roundworm sample and sent it to the Plant-Microbe Genomics Facility at The Ohio State University for gene amplification and sequencing. We built phylogenetic trees using these sequences, and compared these trees to some constructed for the raccoons. The correlations drawn between the raccoon and B. procyonis phylogenetic trees will help us better understand the relationship between the two species.			
Matthew Ingle	Faculty	Science and Mathematics	Baylisascaris Procyonis Prevalence in Raccoons (Procyon lotor) and Its Relation to Landscape Features	Matthew Ingle, Stephen Dunbar, Jaynee Bartsch, Kyle Culbertson, Taylor Fulton, Katherine Guffey, Aubrey Juris, Ashlie Nolan, Dan Nordquist, Carrie Rowlands, Joshua Sitler
	Raccoons (Procyon lotor) are the final host for raccoon roundworm (Baylisascaris procyonis). Raccoon roundworm is the leading cause of a dangerous neurological disease known as larva migrans encephalopathy. Land fragmentation occurs when natural environments are broken up by urban or agricultural landscapes. Raccoons thrive in urban environments, while raccoons in agricultural settings forage over larger areas than raccoons in urban settings do. Land fragmentation affects concentrations of B. procyonis parasites in intermediate hosts. We calculated the prevalence of raccoon roundworm in nine townships of Greene and Clark Counties by necropsying 226 raccoon intestines. Prevalence is defined as the number of raccoons infected with roundworm divided by the total number of raccoons sampled. We determined that the prevalence of B. procyonis from Beavercreek township is significantly lower than the other townships (2 = 25.19, p-value = 0.0007). Prevalence of raccoon roundworm in this region is lower than many areas in the Midwestern United States, suggesting the need for further research to determine reasons for the lower prevalence in the Ohio region.			
Matthew Ingle	Faculty	Science and Mathematics	Baylisascaris Procyonis Impacts Raccoon (Procyon lotor) Diets	Matthew Ingle, Stephen Dunbar, Jaynee Bartsch, Kyle Culbertson, Taylor Fulton, Katherine Guffey, Aubrey Juris, Ashlie Nolan, Dan Nordquist, Carrie Rowlands, Joshua Sitler
	Raccoons (Procyon lotor) are the definitive host for raccoon roundworms (Baylisascaris procyonis). Raccoon roundworm is responsible for a dangerous neurological disease known as larva migrans encephalopathy. Raccoons are omnivorous animals and rely on various food items. Dietary analyses help determine how a raccoon changes its diet in response to environmental features. Raccoons eat whatever food resource is most convenient and abundant. Parasite infections can potentially affect host eating habits in order to keep the host alive and active longer. In this study, we analyzed the diets of necropsied raccoons from 10 townships of Clark and Greene Counties by examining their stomach contents. We categorized stomach contents by separating out plant material, vertebrate tissue, and invertebrate tissue. We measured the total stomach mass and the mass of plant material alone in order to compare and obtain a percentage of plant material in the raccoons' diet. We conducted two chi-squared tests for equality of distributions. We tested the null hypotheses that raccoons from townships with high prevalence (>60%) have the same vertebrate tissue and plant tissue prevalence as raccoons from townships with low roundworm prevalence (<60%) at necropsy. These data will help us understand the relationship between parasites and hosts and help devise management strategies to halt the spread of raccoon roundworm.			

POSTER PRESENTATIONS *(continued)*

College of Arts and Sciences *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Matthew Ingle	Faculty	Science and Mathematics	Comparing Common techniques for Calculating Parasite Prevalence	Matthew Ingle, Stephen Dunbar, Jaynee Bartsch, Kyle Culbertson, Taylor Fulton, Katherine Guffey, Aubrey Juris, Ashlie Nolan, Dan Nordquist, Carrie Rowlands, Joshua Sitler
	Raccoons (Procyon lotor) are the final host for raccoon roundworms (Baylisascaris procyonis). Raccoon roundworm is the leading cause of a dangerous neurological disease, known as larva migrans encephalopathy. Diagnostic tools for detecting the presence of B. procyonis within a raccoon population include necropsy, fecal flotation, and latrine analysis. Necropsies yield the highest measure of prevalence, with fecal flotation and latrine analysis often underestimating infection rates. We necropsied 225 raccoons gathered from 10 townships of Clark and Greene Counties in Ohio. We collected fecal samples from 95 raccoons negative for B. procyonis at necropsy. We suspended the feces in Sheather's solution to float any eggs, and prepared slides from this solution. Nearly 14% of raccoons negative at necropsy for B. procyonis possessed eggs in their feces. We used a chi squared test for equality of distributions to determine the likelihood that a positive fecal analysis is related to B. procyonis prevalence or to the area in which the raccoon was trapped. These data will help us determine how well fecal analyses estimate parasite prevalence.			
Matthew Ingle	Faculty	Science and Mathematics	Does Baylisascaris Procyonis Impact Raccoon (Procyon lotor) Population Genetics?	Matthew Ingle, Stephen Dunbar, Jaynee Bartsch, Kyle Culbertson, Taylor Fulton, Katherine Guffey, Aubrey Juris, Ashlie Nolan, Dan Nordquist, Carrie Rowlands, Joshua Sitler
	Raccoons (Procyon lotor) are the final host for raccoon roundworms (Baylisascaris procyonis). Raccoon roundworm is the leading cause of a dangerous neurological disease, known as larva migrans encephalopathy. Phylogenetic trees illustrate coevolutionary events between species living in a symbiotic relationship with each other. Throughout the coevolution of host and parasite, many aspects of a population affect the way the members interact with one another and with symbiotic species. In order to evaluate the relationship between host and parasite in regards to diet, we isolated DNA from intestinal wall tissue, amplified a portion of exon 2 from MHC II, and sent our samples to Ohio State University for sequencing. We calculated heterozygosities for the nine townships we surveyed. We used a chi-squared test for equality of distributions to test whether raccoons from townships with above 60% prevalence have different heterozygosity for this locus than other raccoons. These data will help us to understand the relationship between raccoons and raccoon roundworm.			
Tyler John	Undergraduate Student	Science and Mathematics	Luther's Existential Imago Dei, the Deprivation Thesis, and Sanctity of Life	Tyler John
	On Ryan Peterson's reading of Martin Luther, the imago Dei (iD) is a human's capacity to experience God. Traditionally, Christians have understood the iD to be a property that a) qualitatively separates all human beings from all nonhuman animals and b) gives humans a greater moral worth than non-human animals. If Peterson's Luther is right, humans made in the iD and no other material created things have the capacity to experience God, and this capacity makes them worth more, morally, than nonhuman animals. I defend this conception of the distinctness of humans by demonstrating the following: For any human being p, the potentiality of p's life for including experiences of God entails that p's life is potentially extrinsically better than the lives of all nonhuman animals. This, in turn, makes p's life worth more, morally, than the lives of any nonhuman animals. First, I state the conditions of an experience of God. Second, I show that, plausibly, only the lives of humans with the capacity for having aesthetic experiences have the potentiality for including experiences of God. Third, I show how instantiated experiences of God can be of such high moral worth that they make entire lives worth more, morally, than all others without such experiences of God. Killing humans may be ipso facto worse than killing nonhuman animals in virtue of their possible future experiences of God. I discuss some of the implications of this understanding of the iD, including the possibility of the iD for severely cognitively impaired humans and the impossibility of iD for non-human animals. Importantly, this formulation of iD spares the "sanctity of life" doctrine from its most scathing critiques by philosophers like Peter Singer. It shows, at minimum, that it is logically possible that the iD is something that is both a) applicable to all humans and b) attributes a morally relevant status to humans that cannot be attributed to nonhuman animals. At most, it presents a novel and insightful way to view the iD and the badness of death.			

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POSTER PRESENTATIONS *(continued)*

College of Arts and Sciences *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Marian Bhajjan	Faculty	Science and Mathematics	Netrin-1-like Peptides Are Secreted by Tetrahymena thermophila	Marian Bhajjan, Kortney Good, Graham Heston, Elise Newcomer, Stephanie Song, Heather Kuruvilla
	Netrin-1 is a peptide signaling molecule that has many roles in vertebrates. In the ciliated protozoan, Tetrahymena thermophila, netrin-1 acts as a chemorepellent, causing cells to exhibit a characteristic avoidance behavior. We have previously shown that netrin-1 avoidance by T. thermophila is inhibited by genistein, which is a broad spectrum tyrosine kinase inhibitor. One question we wished to answer in our current study was, "Is genistein specifically acting upon tyrosine kinases in order to inhibit netrin avoidance in Tetrahymena?" In order to answer this question, we used the phytoestrogen, diadzein, as a negative control for genistein inhibition. Diadzein had no effect on avoidance, suggesting that genistein inhibition is specific. In order to gain more information about the nature of the kinases involved in netrin-1 signaling, we tested several other kinase inhibitors, including a src inhibitor, a focal adhesion kinase inhibitor, and a Rho kinase inhibitor. Each of these kinases has been implicated in netrin-1 signaling in some vertebrate cell types. However, none of these inhibitors affected Tetrahymena avoidance to netrin-1. Finally, we wished to answer the question, "Is netrin-1 actually serving an autocrine signaling role in Tetrahymena, or is the peptide merely serving as an agonist for another receptor?" In order to answer this question, we prepared a whole cell extract of Tetrahymena using 0.1% SDS. We also washed Tetrahymena in our behavioral buffer and allowed them to sit in that buffer for 24 hours. The Tetrahymena were centrifuged out of the buffer, and the supernatant, containing the proteins which the Tetrahymena had secreted, was kept for ELISA assay. An ELISA, using a polyclonal anti netrin-1 antibody, was run on the whole cell extract and the secreted proteins against a netrin-1 standard curve. Both the secreted proteins and the whole cell extract tested positive for netrin-1 in the ELISA. Further experimentation will allow us to determine the nature of these netrin-like peptides.			
Taylor Fulton	Undergraduate Student	Science and Mathematics	Evaluating Fire Temperatures During Prescribed Burn of a Restored Tallgrass Prairie	Taylor Fulton, Connor Gilmour, Titus Hendricks, Mark Gathany
	Wildfire is recognized to have shaped the great prairies of the central U.S. While the vast majority of these grasslands have been lost, there remain significant remnants as well as sites under active restoration. Prescribed fire is often used in these systems in order to maximize the success of the native grasses. Beginning in 1999 Cedarville University established a prairie restoration site and has used disturbances, such as fire, to maintain the system. Without this regular burn, the prairie would likely show decreased grass growth and increased growth of forb species. The Cedarville Prairie Restoration site has a variable topography, with several small hills and valleys. Such variations can affect the way that fire travels and burns. Therefore, our objective is to evaluate the relationships between prairie topography and fire temperature. We will use a 25 x 25 meter grid within the prairie, placing stakes attached to tags painted with thermo-sensitive paint at regular intervals along the grid. Following the prescribed fire in early April, we will we analyze the tags to determine the temperature of the fire at each location on the grid. From this we will generate a heat intensity map in order to investigate patterns. In particular, we anticipate that the fire will burn at higher temperatures on slopes upward from its point of origin. We also anticipate that the fire will burn at lower temperatures in valley areas, due to moisture accumulation.			
Kaitlyn Sturm	Undergraduate Student	Science and Mathematics	Evaluation of Massie Creek's Habitat and Water Quality	Kaitlyn Sturm, Amiah Warder, Malorie Young, Mark Gathany
	In November of 2009, Greene County completed a restoration project on the North Fork of Massie's Creek. This project was designed to address "Erosion and water quality concerns, improve drainage, and restore the habitat of NFMC". The project worked to "Stabilize the stream banks, create riffle/pool habitat, and restore and enhance vegetation along a 2.2mile-long segment of the creek.". The project was finalized with seeding the area in January of 2010. Now four years later we will evaluate the aquatic habitats, macroinvertebrate biodiversity, and water quality in the restored (North Fork) and unrestored (South Fork) segments of Massie Creek as well as points after their confluence. We predict that the water quality, macroinvertebreate biodiversity, and aquatic habitats will be of greater quality in the restored North Fork as compared to the other segments. We will be monitoring water quality (light, temperature, and turbidity) at different points along Massie Creek. Additionally, we will use the Ohio EPA's Qualitative Habitat Evaluation Index to assess habitat quality and macroinvertebrate biodiversity.			
David Dombrowski	Undergraduate Student	Science and Mathematics	Distribution and Diversity of Fish Species in Cedar Lake	David Dombrowski, Katherine Guffey, Brittany Hayes, Mark Gathany
	With over 13,000 described species of freshwater fishes, diversity within aquatic systems can vary extensively. At the local scale, small changes in the diversity of fish species within an ecosystem will modify processes within the ecosystem such as community decomposition and metabolism. Recent analyses indicate that actual species diversity within small, shallow ponds may be higher than previously thought. Fish species distribution will differ based on location within the aquatic system relative to the species' position in the trophic web. We will measure both quantitative and qualitative differences among species at different locations within of Cedar Lake, expecting to find a decrease in both species diversity and total number of fish as the depth increases. We will count the number of fish species and the total number of fish at each depth and use t-test analysis to determine if depth influences fish diversity.			

POSTER PRESENTATIONS *(continued)*

College of Arts and Sciences *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Austin Bush	Undergraduate Student	Science and Mathematics	The Effect of Prescribed Prairie Burning on Small Mammal Population and Distribution	Austin Bush, Randy Howell, Daniel Nordquist, Grace Revenaugh, Mark Gathany
	Prescribed burning is used on prairies for increased prairie health and to manage the communities of organisms that rely on the prairie's natural resources. Small mammals are also affected by the burning of prairies. Previous research by Chance in 1986 and Cook in 1950 has established that burning decreases the small mammal capture rates in the burned area because of the habitat loss and rapid change of habitat post-burn that stresses the animals and leads to lower reproductive levels (Chance, 1986). Other studies by Francl and Small also showed that small mammal populations did not return to pre-burn numbers even after 16 months of evaluation (Francl, K. E., & Small, C. J., 2013). We hypothesize that small mammal populations will decrease in the prairie after burning because of a lack of habitat and food source and that they will emigrate from the burning site to nearby prairie or similar habitat. We will use baited Sherman live traps placed at 25-meter intervals in order to estimate the various small mammal populations in each of the observed habitats. We will plot the capture locations on a map of the area in order to track how stress affects the shift of population density.			
Jack Lightbody	Undergraduate Student	Science and Mathematics	An Energy Use and Emissions Inventory of Cedarville University (2003–2013)	Jack Lightbody, Grant Hooper, Heidi Johnson, Jared Klawer, Mark Gathany
	The rising cost of fossil fuels has been paralleled by an interest in maximizing efficiency and conservation at all levels (individual to corporate). Amidst this, the burning of fossil fuels carries with it concerns regarding the contribution of the resulting emissions to climate change. This has generated interest in energy conservation and the use of renewable energy. In this time period Cedarville University has demonstrated a strong interest in managing its energy use (and associated greenhouse gas emissions) with emphasis on cost effectiveness. Thus, the objective of our study is to analyze Cedarville University's energy use and carbon emissions from 2008 through the end of 2013. We will collect data on all sources of energy use and related emissions including electricity consumption, natural gas for heating, commuting, gasoline consumption, trash output, water use, and paper use. These data will be organized into the Campus Carbon Calculator to determine how much each factor contributes toward the campus' carbon footprint. We will use the data to analyze the efficiency of the campus' energy use by investigating energy use and emissions per student and per square foot of building space over the last decade. These data will serve as an update to the energy audit completed in 2008. Furthermore this will serve as a baseline to compare the lasting impact of the campus efficiency upgrades as well as the 2 megawatt solar array installed in March 2013.			
Dylan McKevitt	Undergraduate Student	Science and Mathematics	Glacial Origin of Massie's Creek Gorge, Greene County Ohio	Dylan McKevitt
	Massie Creek Gorge is one of several small but impressive canyons in Greene County, Ohio, that cut through a typically low-relief landscape. It displays spectacular dolomite cliffs (up to 20 m high), large rockfalls (up to 1800 m3), numerous large potholes (up to >5 m wide and >7 m high), a dry valley branching off the main channel with a resultant bedrock island (≈30,000 m2 in area) and two boulder bars on its lee side (the largest ≈13.5 m thick). Short, dry side canyons are cut to the same depth as the main drainage and sometimes contain potholes on their walls. Massie Creek Gorge's geomorphological features, its location in relation to end moraines from the last glaciation episode, and regional surficial deposits and stratigraphy indicate the terminus of the glacial ice was directly above the proximal end of Massie Creek Gorge. Excepting some late-occurring rockfalls, sediment deposition, aggrading spring deposits, and the undersized river show Massie Creek Gorge is a relict landscape. Joint orientations correlate locally with gorge direction and perpendicular side-streams/crevices, and regionally with morphologically similar Clifton and Glen Helen Gorges. Previous studies concerning these two nearby gorges were analyzed along with work describing glacial history, processes, and features in southwestern Ohio. Studies dealing with pothole types and formation were reviewed and applied to Massie Creek Gorge. The potholes, dry river channel, bedrock island, boulder bars and short but deep side canyons testify to very significant past flow conditions. Evidence suggests the gorge was cut by high-volume, sediment-laden outwash from ice lying in close proximity to the gorge, probably during a glacial outburst flood or rapid glacial melting and retreat. The scale of potholes and boulder bars found within the canyon support this model. The origin of this gorge may provide clues concerning the origin of other deep canyons located near significant end moraines. Morphological features similar to those noted in this study are also seen on extraterrestrial landscapes, especially on Mars. Applying this proposed model for their origin may provide insight into past conditions and processes, and further this blooming field of extraterrestrial analysis.			

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POSTER PRESENTATIONS *(continued)*

College of Arts and Sciences *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
April Menendez	Undergraduate Student	Science and Mathematics	Developing Criteria for Identifying Fossil Raindrop Prints	April Menendez
	Raindrop imprints have been identified many times in the rock record as stated in papers by Rindsberg, Shul'ga 2004 and Kahle 2009. However, there is a question of whether those raindrops have been determined accurately or if the spherical depressions are caused by some other occurrence. Studies by Twenhofel have been done that describe raindrop prints in modern sediment, and the research conducted during this project continues to broaden that field of information. During this research project, experiments were carried out to collect the appearance of raindrop prints in sand, both wet and dry. After photographs of the imprints were taken, the pictures and measurements of the gathered raindrop prints were compared to fossil raindrop prints, so as to determine if the depressions identified as raindrop prints in the rock record are accurately labeled, or were caused by some other process, such as air bubbles. The method to simulate raindrops consists of dropping 0.1mL drops of water from a third floor down to the first floor, onto a flat pan of sand sifted to 3 phi size and under. At this distance, raindrops are properly replicated as they would be in nature. The imprints were then examined, measured – both their width and their depth, and photographed. Most raindrop imprints in dry sand were 4-2mm deep and 7mm wide, while those in wet sand were wider, 1cm and a little over, but not as deep, ranging from 1.5–2mm deep. These raindrop prints have distinctive features, such as their wide spherical shape and the ledge around the imprint from pushed sand, and while some fossil depressions have these characteristics and may be fossilized raindrop prints, many do not and need to be reexamined under the new information and perhaps categorized as gas escape structures.			
Andy Johnson	Undergraduate Student	Science and Mathematics	Soil Bulk Density Variability in a Restored Prairie Ecosystem	Andy Johnson, Emilee Kurtz, Andew Martinson, Steve McCown, Mark Gathany
	Soils act as the foundation for all terrestrial biotic activity. Given this, it is important to consider the factors that influence the physical makeup of soil as well as the management practices that can lead to changes and significant biological implications. Beginning in 1999, Cedarville University established a Prairie Restoration Site. In the past 15 years work has been to done to reseed the area with native prairie grasses as well as to introduce regular disturbances that are common to prairie grasslands, such as fire. The goal of this work the goal has been to aid a system in ecological succession. In the current study, we seek to evaluate the success of this with regard to the corresponding changes in the soil environment. We look to distinguish this source of variability from the natural variability introduced by the physical landscape (slope) and the resulting soil series. To evaluate these ideas, we will investigate how two factors, soil series (corresponding to slope position) and prairie restoration, affect soil bulk density. We collected soil samples (to a depth of 15 cm) from the restored prairie as well as the adjacent area. In addition to this variable, we acquired samples in both locations across a range of three different soil series distributed within this same area. Specifically, we collected samples from the XeB-Xenia B, Ra-Ragsdale, and Russel-Miamian - RvB2 soil types. We will use a two factor ANOVA to evaluate the impact of a change in soil series, or prairie restoration on soil bulk density.			
Ethan Shula	Faculty	Science and Mathematics	Photomicrograph Analysis of Marcellus Well-Cuttings from Northeast Pennsylvania	Ethan Shula
	Often times, when an oil or gas well is drilled in an area with limited geophysical and mud logs, the geologist or mudlogger describing the drill cuttings may wonder about the veracity of their work. Such an uncertainty may initiate a decrease in the rate of the mudlogging process, or in determining how far drilling has advanced in relation to the target zone. If a descriptive guide containing photomicrographs was available early in the development of a new gas field, mudloggers would be more certain in their analysis of the cuttings. In order to test this idea, a descriptive guide was created to help with the identification of drill cuttings from a natural gas well drilled in Sullivan County, PA, located in the Marcellus shale play of northeast Pennsylvania. The well was sampled every 30' starting at a depth of 600' and ranging to 8,500' below the surface. Basic lithologic types encountered during drilling and mudlogging included sandstone, siltstone, limestone and shale. Representative samples of each significant lithology were analyzed for this study. The created guide utilizes photomicrographs taken with a Motic 2300 camera mounted on a Motic polarizing microscope. Helicon Focus software was used for focus stacking. The photomicrographs have been matched with data and descriptions from the on-site mudlogs which list both formation tops and the lithological sequences. Printed color hardcopies and DVD versions of the guide will be distributed to the operator who provided the cuttings for the study. A request will be made that the operator provides feedback regarding the usefulness of the guide.			

POSTER PRESENTATIONS *(continued)*

College of Arts and Sciences *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Andrew Wagers	Faculty	Science and Mathematics	Supernovae Wavelet Spectral Index Method: A Step Toward Precision Cosmology	Andrew Wagers, Lifan Wang, Steve Asztalos,
	As cosmological probes, Type Ia Supernovae are some of the most useful. These exploding stars are used to measure cosmic distances and are useful to test and refine cosmological models. While SNe Ia are extremely uniform, the need for more precise measurements of the peak magnitude has led to the development of methods to correct current measurements for statistical errors. The work presented here has developed a new method for measuring the strength of spectral lines with a goal of using them as a basis for correcting the measured peak magnitudes. Wavelets were used to decompose the spectra so that the noise and large scale structure of the spectra were removed. From the resulting spectra it is straight forward to establish a new method of measuring the strength of the spectral features. The subgroups which have been proposed are reproduced by this method, also Principle Components Analysis was applied to the data set and the Philips relation between peak magnitude and the rate of change of the magnitude was confirmed. Future work involves development of a correction term to the Hubble Diagram and an algorithm for producing synthetic spectra.			
Danielle Swanson	Undergraduate Student	Science and Mathematics	Oxygen Content & Biochemical Oxygen Demand (BOD) in Cedar Lake	Danielle Swanson, Angela McCain, Paige White, Samuel Scherneck, Mark Gathany
	In an aquatic system, there is a balance between the production and consumption of oxygen. Oxygen is produced by photosynthetic microorganisms, and is taken directly from the atmosphere; it is consumed by the respiration of aquatic animals, decomposers, and a myriad of other chemical reactions. The biochemical oxygen demand (BOD) is the amount of oxygen consumed by organisms and is measured as dissolved oxygen (DO). DO concentrations are dependent upon temperature, wind and other physical factors, fluctuating diurnally. In our experiment we will compare the DO concentrations at different depths in Cedar Lake. We will accomplish this by using a dissolved oxygen meter (YSI DO probe) to collect DO at depths of 1-foot intervals, starting from the surface of the water. We will also collect data on the temperature and wind speed at the same time to determine how they affect the DO concentrations at each depth, on each day. We expect to see higher levels of dissolved oxygen at the surface of the lake due to the closer proximity to the atmosphere and the churning effect of the wind. Although the water at the bottom would likely be colder, and therefore hold more oxygen, it is also being consumed by decomposers.			
Adam Levesque	Undergraduate Student	Science and Mathematics	Tree Biomass and Carbon Storage in an Old Growth Forest in Southeastern Ohio	Adam Levesque, Christina Gall, Doug Fox, Karen Washburne, Sam Scherneck, Mark Gathany
	Recently there has been increased interest in determining the baseline levels of carbon storage in different ecosystems, because of greater concern over the issue of global climate change and increased atmospheric CO2 concentrations. With a better understanding of carbon sequestration in various ecosystems, we can use land in a more environment-conscious way, and negative human impacts on the earth can be decreased. Forest ecosystems are especially important, because they have an immense capacity to store carbon as compared to other ecosystems. The majority of carbon sequestered in forest ecosystems is contained in tree biomass, but there is also carbon contained in soil, leaf litter, and necromass. The primary objective of our experiment was to determine and compare the baseline amount of carbon sequestered in the biomass of different forest plots: old-growth versus young-growth and north-facing versus south-facing. We also compared these results to data that had been collected from the same plots in 2003. We found that for the most part, the amount of biomass had decreased; the only exception was the north-facing young-growth stand. This forest plot contained the most biomass, followed by the old-growth south-facing, then the young-growth south-facing, and then the old-growth north-facing. We believe that the reason for the overall decrease in biomass was a large number of fallen trees.			
Alicia Schaffner	Faculty	Science and Mathematics	Regulation of Genes by ETS Transcription Factors	Alicia Schaffner, Zach Sirois, David Barton, Bryan Grove
	The interaction of growth factors with their receptors triggers a cascade of intracellular signals that can result in the activation or repression of various genes. The variation in gene expression ultimately gives rise to diverse biological effects such as differentiation and proliferation. Aberrant expression of these genes often leads to cancer. Our lab focuses on a signal transduction pathway that is downstream of Ras, which is one of the most frequently activated oncogenes in human cancer. Growth factors bind to their cognate tyrosine kinase receptors, which ultimately lead to the activation of Ras. Activated Ras leads to the activation of one well-characterized downstream effecter pathway of Ras – the Raf/Mek/Map Kinase pathway. Once Map Kinase is activated it translocates to the nuclease and regulates transcription factors via phosphorylation One well-known target of Map Kinase, particularly Ets-2, is a member of the ETS families of transcription factors. These transcription factors have been linked to tumor progression in several types of cancers. They regulate the expression of genes that play a role in the regulation of cell cycle, apoptosis, extracellular matrix remodeling, and cell migration. Therefore, ETS transcription factors are thought to play a key role in tumor invasion and metastasis.Phosphorylation of Ets-2 leads to the expression of known target genes such as c-myc, MMP-9, and miR17-92. One way that transcription factors exert their effects are by altering the chromatin environment. Two key mechanisms for altering chromatin structure are by chromatin remodeling complexes and histone modification enzymes. Ets-2 is known to interact with different subunits of both remodeling and modification proteins. However,t it is unknown what the outcome of this interaction is. We have hypothesized that the interaction of ETS-2 with CBP, (a well-known histone acetyltransferase) leads to an increased acetylation of histones, which leads to the expression of target genes. We are investigating this by performing ChIP (chromatin immunoprecipitation) analysis.			

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College of Health Professions

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Benjamin Dixson	Undergraduate Student	Kinesiology and Allied Health	Preparticipation Cardiovascular Screenings in Athletics	Benjamin Dixson
	Preparticipation cardiovascular screenings are a key method of injury prevention utilized in athletic training and sports medicine. Much research is available to describe the key components of a cardiovascular screening, but not much research has been conducted regarding the current clinical practices of this idealized screening model. The primary purpose of this study was to describe the current cardiovascular screening practices of clinicians in high school, collegiate, and professional athletic settings. The secondary purpose was to evaluate whether or not current cardiovascular screening practices align with the current, evidence-based recommendations regarding cardiovascular screening practices. Surveys were sent to certified athletic trainers who perform cardiovascular screenings in a variety of settings. The survey contained questions regarding demographics and specific questions about the subject's preparticipation cardiovascular screening. The survey closed after eight and the 17 respondents' responses were analyzed. Three One-Way ANOVAs were conducted. The priori alpha level was set at $p < 0.05$. Results found significant differences between job setting and last update to the clinician's screening ($p = 0.023$) and between job setting and the 14 preparticipation screening questions/tests (for two of the questions/tests). The two questions/tests that had significant differences were inquiring about shortness of breath and fatigue with exercise ($p = 0.046$) and requiring parental verification of past medical and family history ($p = 0.009$). We concluded that the current clinical practices or preparticipation cardiovascular screenings in high school, collegiate, and professional athletic settings are not completely compliant with the current, evidence-based recommendations regarding cardiovascular screening practices. Mainly this noncompliance is due to the inconsistent performance of special testing during the physical examination portion of the preparticipation cardiovascular screening. Clinically, these results indicate that clinicians need to update their preparticipation cardiovascular screening to meet the current recommendations and follow their updated screening requirements without omitting steps.			
Levi Fenton	Undergraduate Student	Nursing	Skin Preparation for Preventing Infection Following Cesarean Section	Levi Fenton, Alexandra Barford, Adrienne Barnett, Meghan Becker
	Cesarean section (c-section) is becoming a popular option with 32.8% of the population choosing a surgical procedure over a vaginal delivery. Due to the increase of c-sections, infection rates have risen to a rate of 5.4 infections per 100 c-section operations. Surgical site infections are a large risk for any person having an invasive procedure. In our review of literature, we searched for the most advanced methods to reduce the risk of surgical site infections. We searched for various articles comparing iodine and chlorhexidine and found 14 articles that fit our inclusion criteria. The inclusion criteria consisted of any literature that included information about surgical site infections, c-sections and preoperative skin preparation methods, along with literature related to iodine or chlorhexidine. Our exclusion criteria consisted of studies done prior to 2004 and articles that focused on intra-operative or post-operative preventative care. The review of literature was limited by three factors: (1) Multiple articles from other countries have researched chlorhexidine and iodine, but were not specific to the United States; (2) Limited overlapping research topics between c-sections and surgical site infections; (3) The results of the review of literature were not able to be tested. After studying and comparing the articles, the results showed that chlorhexidine is the most advanced antiseptic for preventing a surgical site infection after a c-section. Based on the review of literature, recommendations for the use of chlorhexidine should be enforced in hospitals that use iodine.			
Suzanne McReynolds	Undergraduate Student	Nursing	The Therapeutic Effects of Nature, Urban, or Standard Hospital Decorations on a Hospitalized Patient	Suzanne McReynolds, Carissa Leitch, Meredith Knowland, Caroline Wills,
	Purpose: To review the present literature that evaluates the therapeutic effects of nature on hospitalized patients as compared to urban decoration or a standard hospital atmosphere *Background*: Research on the topic of nature's effects on hospitalized patients began in 1984 by Ulrich. While this study brought forth many positive effects of nature, further study on the subject has only recently been continued. Reviews on whether or not there is evidence to support nature in hospitals are limited and have only begun to be addressed in practice. *Methods*: Articles published between 2008 and 2013 found in *Pub Med*, *One Search*, *Ebsco*, and *Medline* were reviewed that contained the following keywords: nature, nature in hospitals, gardens, hospital gardens, gardens in hospitals, scenery, hospital landscape, hospital scenery, plants, or plants in hospitals Findings: The current evidence base supports the use of nature for hospitalized patients because of its therapeutic effects of decreasing pain, reducing stress, decreasing healing time, and uplifting their mood *Conclusions*: The positive effects of nature which arose from the literature reviewed indicate the priority to incorporate nature into hospitalized settings to improve patient care and outcomes.			
Peyton Hannon	Undergraduate Student	Nursing	The Progression of Prediabetes to Type 2 Diabetes Mellitus through Increasing Physical Activity and Healthy Diet	Peyton Hannon, Hayley Blackburn, Ella Kinsinger, Rachel Meeker
	Background: Health care professionals have started to diagnose patients as prediabetic in efforts to monitor and intervene in the disease process of diabetes before the person reaches the complete diagnosis of diabetes. Specific interventions, such as physical activity and diet, are considered to be major contributing factors in reducing the progression of diabetes and potentially reversing the process of this disease. *Purpose*: The purpose of this paper is to compare the effectiveness of diet modification versus increased physical activity during the prediabetic phase in reducing the progression to Type 2 diabetes. *Methods*: A literature review was conducted using sources written within the past seven years taken from four different databases. The databases used were CINAHL, Academic Search Complete, Cochrane Database of Systematic Reviews and Food Science Source. The focus of the search was to obtain articles that examined nursing interventions for patients in the prediabetic state *Results*: The literature review examined nine articles and synthesized evidence from 6 of the articles. The levels of evidence for these articles included level 1, 2, and 4 of quantitative research articles. The interventions of increased physical activity and modified diet both proved to be effective in reducing the progression of diabetes. Neither one revealed to be more effective than the other. *Conclusion*: The results of the review were inconclusive in determining whether increased physical activity or diet was more effective in reducing the prevalence of diabetes in patients with a prediabetes diagnosis. Further research is needed on this topic in order to make a conclusive decision. *Keywords*: Prediabetes state, Prevention, Interventions, Physical Activity, Diet			

College of Health Professions *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Sara Savard	Undergraduate Student	Kinesiology and Allied Health	Thoracic Gas Volume in Athletes and Non-Athletes	Sara Savard
	The purpose of this study was to analyze the predicted thoracic gas volume versus measured thoracic gas volume in college students, comparing NCAA collegiate athletes versus non-athletes using the Bod Pod. Forty-four college students, both males and females, athletes and non-athletes, completed a body composition test to obtain the predicted thoracic gas volume. The participants were then instructed by the Bod Pod software through the measured thoracic gas volume test. Due to low statistical power, athletes and non-athletes were unable to be compared, however, results of a two sample t-test showed that there was a statistically significant difference between measured thoracic gas volume and predicted thoracic gas volume within the population as a whole. The average predicted thoracic gas volume was 3.66 liters ± 0.103, while the measured thoracic gas volume was 4.02 liters ± 0.165. The significance level for the test was $p \leq 0.05$ and the p-value obtained from the statistical analysis was $p \leq 0.001$. It was concluded that within this study, there was a significant difference between the predicted and measured thoracic gas volumes of the population.			
Natasha Kreft	Undergraduate Student	Psychology	Resilience in the Hybrid Culture of the Military Reserve: A Case Study	Natasha Kreft
	This case study involved interviews with a group of Reservists and Veterans Reservists, all of whom had deployed. As Reservists alternate between jobs or college and active duty or deployment, these constant transitions can cause significant psychological challenges. We propose that Reservists should be considered as possessing a hybrid culture, comparable to civilian and military cultures. Reservists are sandwiched between the demands of civilian and military cultures, and a successful acclamation into this hybrid culture necessitates resilient psychological adaptability on the part of the Reservists. This study highlights areas where collaborations are required to establish resilience in this hybrid culture.			
Katrina Mervine	Undergraduate Student	Nursing	Oral Care Interventions to Prevent Ventilator-Associated Pneumonia in Mechanically-Ventilated Adults	Katrina Mervine, Sarah McColloch, Kelsey Ruby
	Background: Ventilator-associated pneumonia is a common and costly problem in acute care settings. Each case has an increased chance for mortality and may result in further complications. *Purpose*: To review relevant literature about the methods of providing oral care for ventilated patients to prevent the incidence of VAP in acute care settings. *Methods*: Literature published between 2008 and 2013 was reviewed using PUBMED, MEDLINE, CINAHL, Cochrane, and Up To Date using the key words "oral care," "ventilator- associated pneumonia," "toothbrushing," "VAP," "oral hygiene," "hydrogen peroxide," and "pneumoni. *Setting*: Mechanically ventilated adult patients in acute care settings. *Sample Size*: The literature review was conducted on five meta-analyses, four randomized control trials, one cohort study, and one non-randomized control tria. *Findings*: This literature review found that research supports the use of chlorhexidine in acute healthcare settings in the prevention of VAP. *Conclusions*: Reduction in the incidence of VAP occurred with Chlorhexidine use added to patient oral care but more research is needed in the area of prophylactic oral care. *Clinical Relevance*: The findings provide direction for future research done on the subject and support the recommendation of the use of Chlorhexidine in oral care for mechanically ventilated patients.			
Rachel Yutzy	Undergraduate Student	Social Work	Equal Access to Education	Rachel Yutzy, Tina Benjamin, Jessica Dickhoner
	The purpose of our research study and presentation is to identify key factors in access to education in three regions of the world. We looked into access to education in China, India, and the United States (urban) education systems in order to understand the barriers within each educational system. The Chinese educational system has been seen as an exemplary model of education, with the majority of students excelling in their work. However, many different factors contribute to disparities in access to education such as social status, economic background, and ideology. India is a prominent global economic leader, yet struggles with a large illiteracy rate. Its educational system is world renowned for the number of existing schools in rural villages, as well as the complexity and variability of educational requirements. However, there are also challenges to the system, including teacher shortages, mandatory passage requirements, and dangerous conditions of school facilities. The United States also has great disparities in access to education. Though education is available and mandated, urban schools lack funding and qualified teachers. Access to education in the U.S. is largely based on location. We have researched academic and professional journals, books, and personal testimonies in order to present accurate and thorough research on access to education in each of these areas.			
Timothy Waller	Undergraduate Student	Kinesiology and Allied Health	Concussion Return-to-Play Protocols Effect on Athletes Reporting of Symptoms	Timothy Waller
	When an athlete suffers a concussion, the standard return to play (RTP) guidelines are that they must sit out a minimum of a week as they go through a slow progression of exertional and neurocognitive tests once they are asymptomatic. This is a great improvement to concussion treatment in the past where athletes were often dangerously returned. However, because of this "blanket" seven-day minimum return policy, we believe the current RTP guidelines are potentially leading athletes to hide their symptoms more so they do not have to sit out. Fifty-three athletes were surveyed from soccer, basketball, lacrosse, and football teams from three universities in Southwest Ohio (ages 18–22, 34=male, 19=female). The survey contained questions about their demographics, concussion symptom knowledge, concussion history, potential reporting of concussions, and opinion on their university's return-to-play policy. The results showed that 40% of athletes would be willing to hide their symptoms of a mild concussion and 21% believe that their university's return to play policy affects this decision. While the results do not completely confirm our hypothesis, we still believe that the numbers we received in our study are enough to warrant a consideration of the current "blanket statement" return-t-play policy in favor of a very similar but more individualized version.			

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POSTER PRESENTATIONS *(continued)*

College of Health Professions *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Rebecca Williams	Undergraduate Student	Kinesiology and Allied Health	Athletes' Knowledge and Attitudes Toward Concussions	Rebecca Williams
	Concussions are a serious injury with significant short and long-term consequences. With the increasing awareness of the dangers of concussions, research has been directed toward educating coaches, athletes, and clinicians about this condition. The purpose of this study was to evaluate DII football athletes' knowledge and attitudes toward concussion, so we can determine what education is necessary to better inform them, in order to be able to conduct a more efficient evaluation. A total of 55 male football athletes from NCAA DII institutions agreed to take part in the survey on a voluntary basis. Subjects completed a survey assessing athletes' knowledge and attitudes toward concussions. Survey questions included those on concussion symptoms, return-to-play guidelines, and education they received about concussions prior to taking this survey. The results of the study indicated that the majority of subjects had received some type of education on concussions. There were no statistically significant changes observed among any of the survey questions regarding knowledge and attitudes toward concussions, except for one that addressed the long-term effects of returning to play too soon following a concussion. Other significant findings were related to return-to-play protocol. Based on the results of the study, we determined that DII football athletes are well-informed about concussions, but that this general knowledge does not necessarily facilitate an attitude change in how they perceive concussions. Future efforts should be directed toward evaluating the effectiveness of concussion education for specific changes in overall perception, causing athletes to report concussions on a more consistent basis, regardless of the severity of the symptoms or the situation in which the concussion is sustained.			
Lindsay Smith	Undergraduate Student	Social Work	Business, Human Rights, and Corporate Social Responsibility	Lindsay Smith, Ashley Wolf, Victoria Mueller
	This presentation is a review of the literature on business and human rights and Corporate Social Responsibility. Globalization has lead to human rights and business being a combined topic. The United Nations and other countries have began to recognize human rights with labor regulations due to the misconduct in applied legislation. Our research focuses on the country of Myanmar also known as Burma. The United States in particular has had a long history working with Myanmar. During the 2000's American companies have been developing strict labor policies. Through research, companies discovered that implementing business policies and labor regulations programs increase the community's development. A case study shows how Coca-Cola worked in Myanmar to form a strategic plan assisting Myanmar's community. Through corporate responsibility and labor solidarity, companies can work in high-risk environments and achieve positive outcomes.			
Kara Nonnemacher	Undergraduate Student	Psychology	Working Memory in Musicians Versus Non-musicians: A Differential Study Using the N-back Task	Kara Nonnemacher
	The current study investigates whether long-term musical training and practice are associated with greater working memory abilities. Other studies have shown that musicians have cognitive advantages over non-musicians, including working memory. Forty-six college-aged participants were given an auditory-spatial n-back test. The n-back test requires participants to determine whether or not each auditory and spatial stimulus in a sequence matches the stimulus n stimuli ago. In this study, n=2. Participants were classified as either a musician or non-musician based on their years of musical training. Comparing n-back scores between musicians and non-musicians showed no significant findings. Since other studies have shown that musicians do have better working memory skills, this study may have lacked true professional musicians and a large sample size.			
Heidi Johnson	Undergraduate Student	Psychology	The Effect of Familiarity With Background Music on College Students' Performance of Reading Comprehension Tests	Heidi Johnson, Ben Holdredge, William McKinley
	The current study examined 85 university students' performance in a reading comprehension task under three conditions: silence, familiar, or unfamiliar music. The results indicated that the students in the familiar music condition performed significantly worse than those in the silent conditions, as well as those in the unfamiliar music condition.			
Ruth Markham	Faculty	Psychology	A Qualitative Study of Pastors' Kids at College	Ruth Markham, Eric Skowronski, Monica Arslain, Kaitlyn Fletcher,
	Children of pastors (PK) are commonly stereotyped in one of two different ways: either they are seen as the model child, or as the prodigal (Barna Group, 2013). The model child is perceived as sheltered and naïve, with expectations placed on them to follow in their parents' footsteps of faith and practice. The rebel is perhaps the more common stereotype, where children of pastors are seen as having negative feelings toward their father's position, and wanting to make their own mark on the world and find their own faith journey. The purpose of this study was to determine if either of these stereotypes, or other unifying factors, were present and continuing into their college years. We interviewed 15 college students at a Midwestern Christian University, whose fathers were pastors of medium-sized churches (200 to 500 members). While each student interviewed commented on expectations from society in general, their personal experiences varied between the two stereotypical extremes. Apart from the acknowledgement of the stereotypes themselves, we found no major themes common to a majority of the students. This leads us to believe that the widely held stereotypes about pastors' kids are not accurate or complete. It appears that these students are very much like their non-PK peers, varying to the same degree in their faith and life journeys, family dynamics, and social interactions.			

POSTER PRESENTATIONS *(continued)*

College of Health Professions *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Lynley Turkelson	Undergraduate Student	Psychology	Magical and Illusory Thinking in Protestant College Students	Lynley Turkelson
	Scrupulosity (SC) is a subtype of OCD that manifests in religious obsessions and compulsions. Scrupulosity is associated with poorer prognosis and higher levels of magical ideation (MI), defined as beliefs that go against culturally accepted laws of causality. A new measure called the Illusory Beliefs Inventory was created to measure MI in scrupulous populations. However, the items on the spirituality subscale may fail to discriminate between pathological thinking and normal religious beliefs. The current study contained two purposes. The first purpose was to examine the psychometric properties of the IBI. The second purpose of the study was to clarify the relationship between scrupulosity and magical ideation in Protestant Christians. Higher scores on MI measures may simply reflect normally elevated levels for religious individuals produced by the IBI's misdiagnosis of normal spirituality as "magical thinking." We hypothesized that magical ideation as measured by the IBI will be high in our Protestant sample when including factor 2 (spirituality), but scores that remain high with the removal of factor 2 will correlate with higher scores on measures of OCD and SC. The final sample size included 517 undergraduate students with a mean age of 20. Complete data analysis is in progress, but preliminary analysis reveals significant elevation of mean scores on the spirituality subscale as predicted. Final results will be presented.			
Elizabeth Garland	Undergraduate Student	Psychology	Residual Spiritual Shifts Regarding the Homeless Resulting From a College Poverty Immersion Experience	Elizabeth Garland, Heidi Johnson
	We report the results of a qualitative study, having interviewed 20 students who had 1.5 years previously been involved in a collegiate, weekend poverty immersion experience. We coded the transcripts, analyzed the data from a phenomenological framework, provided checks for internal validity, and report the common themes from the participants' interviews.Three overall results were evident. First, participants reported believing that, generally, the church is ignorant regarding the needs of the poor and impoverished people around them. Second, students generally did not believe that the church was doing enough in order to combat poverty and/or homelessness, mentioning that the church's outreach ministries are often ineffective. Third, students reported believing that the church is responsible to care for the poor and thus, Christians as a whole should be more involved than they are presently. The study's results are discussed in the context of social psychology findings, published research literature reading how contemporary Christians generally fare at helping impoverished individuals, and the long term effectiveness of active, experiential learning in higher education.			
Hans Stoltzfus	Undergraduate Student	Psychology	The Perspective of College Seniors in ROTC on Becoming a Commissioned Officer	Hans Stoltzfus, Natasha Kreft,
	While there is growing research into military and mental health issues, the focus of such research has primarily been restricted to those populations who are retired from military or who step down from active duty. Following a case study with reservists, we became aware that mental health issues in the military population may potentially stem from concepts involved the initial training phases. With the hypothesis that ROTC cadets are among the youngest persons engaging in military training, we approached ROTC Air Force and ROTC Army cadets who were seniors by credit at Cedarville University. The Cadets were asked to participate in a face-to-face interview with a researcher, to share their experiences of ROTC and their perspectives on what life as a commissioned officer would be like. Participation in the interviews was voluntary, but the Air Force Commander and Army Commander had informed their cadets that this study had been approved by them and participation was encouraged. Participants included both male and female Cadets from a broad range of academic majors. The interviews were analyzed and six themes emerged: (a) Being associated with high caliber professionals (b) Balancing military persona with non-military persona (c) Skills and strategies for success in life (d) Personal values (e) Awareness of challenges (f) Impact of training on persona. Overall, the cadets expressed excitement at the prospect of becoming commissioned officers, and pride in being among those who serve their country.			

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College of Professions

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Brenda Mackay	Faculty	Education	Preservice Teachers' Use of Frustration to Enhance Communication	Brenda MacKay, Annis Shaver
	Pre-service teaching, a required component of accredited teacher education programs across the United States, provides the opportunity for pre-service teachers to not only teach in their specific fields, but also to work with specific populations of students, such as English Language Learners (ELLs). Rarely, however, do pre-service teachers from the U.S. have the opportunity to teach ELLs in contexts where languages other than English and cultures other than American are dominant. This presentation reports how pre-service teachers teaching ELLs in just such situations dealt with frustrations common to pre-service teachers and also frustrations due to situational contexts. Through self-reporting, these pre-service teachers describe how they used these frustrations to inform their conceptual knowledge, to make changes in their own English while teaching English to others, and to improve their teaching skills.			
Timothy Norman	Faculty	Engineering and Computer Science	Taper-Trunion Interface Stresses in Metal-on -Metal Hip Implants	Timothy Norman, Scott Gardner, Andrew Orton, Sharon Grafton, Dr Thomas Fehring
	Metal-on-metal (MoM) total hip arthroplasty describes a hip joint replacement where a metal (cobalt chromium) femoral head articulates against a metal socket. This implant scenario has generally been successful until recently when larger (> 36 mm) metal heads have become more popular as a means to reduce the incidence of hip joint dislocation. Today, the number of clinical failures (described by fretting corrosion and a need for revision surgery) of MoM total hip arthroplasty is occurring at unacceptable rates. The objective of our research was to investigate the effect of horizontal lever arm (HLA), a geometric variable that increases with femoral head size, on trunnion-taper contact stresses. We hypothesized that trunnion-taper contact stresses increase with head size. Such increases may be responsible for increases in the potential for fretting wear and subsequent corrosion. We tested our hypothesis by conducting finite element analysis (FEA) of a titanium alloy hip stem and five femoral heads under four different loading conditions. The implant and head were assembled in such a way to simulate a Morse-taper fit. Four load cases were applied: the average force experienced during single legged stance, the average and maximum force experience during stair climbing and the force experienced during stumbling. The maximum von Mises stresses experienced at the trunnion-taper interface for each load were compared. Our results showed that increasing the head size of the implant increases the stresses experienced by the trunnion and taper for stairclimbing and stumbling due to the offset in loading with respect to the trunnion axis. Certain load cases, such as stair climbing and stumbling, with a larger HLA cause the trunnion to experience stresses close to or exceeding the yield strength of the implant material, which may contribute to an increase in fretting wear at the trunnion-taper junction. It was concluded that smaller to mid-sized heads (≤ 36mm) should be used for implants, in order to avoid high trunnion-taper interface stresses that occur for certain loading conditions.			
Joel Hutchison	Undergraduate Student	Engineering and Computer Science	Determining Knee Loading for Abnormal Gait	Joel Hutchison, Dana Madsen, Timothy Norman, JD Blaha M.D.
	The purpose of this study was to take known experimental loads throughout normal gait and to find the corresponding loading at the knee for both normal gait and abnormal gait. Abnormal gait was defined as a person with varus, i.e., "bowleggedness" or a person who had an external rotation of the femur (or the inability to internally rotate the femur) which caused an indirect varus in the forward positions of gait. This problem was approached by imposing static equilibrium on the femur. This allowed the loads at the knee to be calculated from the loading at the hip. In order to find the forces for abnormal gait, the angular movement of the femur from the normal location was determined. Then, the forces applied to the femoral head were rotated in relation to the femur in order to simulate where the force would be applied when the bone was in the new position for abnormal gait. Once the forces at the hip were rotated about the femoral head, the loading at the knee for each of the cases was determined. The code written allows a user to define the amount of varus and external rotation. The user can then see a graphical representation of the loading through the gait cycle on the knee. Additionally, the maximum loading cases of gait at the knee are recorded and shown. The key thing noted in the results was an increase in adduction moment for the abnormal gait cases in comparison to the normal gait. Understanding knee loading for abnormal gait will help design engineers understand the range of loading conditions of knee implants in-vivo.			
Gerald Brown	Faculty	Engineering and Computer Science	The Scholarly Role of Faculty Advisors in Student Engineering Competition Projects	Gerald Brown, Timothy Dewhurst
	Engineering faculty advisors at Cedarville University work closely with senior engineering students on the Solar Boat team to improve the boat's performance each year and continue the team's legacy of seven wins in the last 10 years at the Solar Splash Competition. The faculty-student relationships are at times similar to that of a mentor and apprentice, and at other times similar to that of an engineering manager and a team of engineers. This mentor/manager approach allows us to maintain technical continuity from year to year between student teams, develop and maintain an increasingly sophisticated team knowledge base, coach the students through design issues beyond the scope of their classroom instruction, and model the diligence, effort, and attention to detail that are essential for success at the international level in student engineering competition. Each year, the students on the Solar Boat Team seek to improve several aspects of the boat's hull, electronics or drive system. They follow a design process that includes background research, developing a proposal, designing and modelling components and circuits for in-house manufacture or purchase from vendors. The unique nature of the project often leads to design solutions that are not commercially available and requires the students to work with potential vendors in a guided development process to produce something that does not currently exist. In this process, the students develop practical communication strategies with busy vendors, learn to assess the technical validity of potential solutions, and develop expertise in specific details of the project; areas that are sometimes beyond the experience or expertise of their advisors.			
Thomas Thompson	Faculty	Engineering and Computer Science	Interact with Speciknee: a Software Tool for Design of Simple Four-bar Prosthesic Knee Joints	Thomas Thompson
	This poster and interactive demonstration presents an educational computer design tool that could enable prosthetists and mechanical designers to tailor the motion of low-cost, four-bar prosthetic knees to the sizes and needs of individual amputees. In designing a prosthetic knee joint, it is important to control the position of the lower leg in three angles of flexion and to control its center of rotation in the standing position. In 2010 [1] this problem was analyzed using vector methods, and an algorithm was written which produced curves displaying pivot locations that solve the problem exactly. Since then, a software tool called Speciknee has been developed by building on the core vector computational method and adding a user-friendly operator interface through which a designer could input individual patient needs, select pivot points along the set of curves where prosthetic joint pivots could be placed, and animate the mechanism.[1] Thompson, Thomas J., 2010, "Specification of Prosthetic Knee Kinematic Design Parameters Using a Three-position, Instant-center Specification Approach," paper No. IMECE2010-38645, Proceedings of the ASME International Mechanical Engineering Congress and Exposition, Vancouver, British Columbia, Canada, November.			

School of Pharmacy

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Trevor Stump	Graduate Student	Pharmacy	Natural Products as Therapeutic Agents in Cancer Treatment	Trevor Stump, Lauren Williams, Brittany Santee, Chelsae Ward, Rachel Kunze, Dr. Denise Simpson, Dr. Samson Amos
	Cancer accounts for 25% of deaths in the United States, and brain tumors greatly contribute to this percentage. However, relative to other types of cancers, brain tumors prove difficult to treat because they are heterogeneous, highly proliferative, highly invasive, and resistant to the traditional cancer treatments of chemotherapy and radiotherapy. Past studies have shown that flavonoids and curcuminoids, two classes of compounds derived from natural sources, are effective in inhibiting the development and metastasis of breast and lung cancer cells. Research has also indicated that these compounds have potential for treating brain tumors. The purpose of this research is to further explore the potential of flavonoids as therapeutic options for the treatment of brain tumors. Specifically, flavonoids' effect on cell proliferation, cell death, and tumor invasion will be studied. Another objective of this study is to identify the signaling mechanism by which flavonoids mediate their therapeutic effects on brain tumor cell lines. Three human brain tumor cell lines (U-1242, U-251, and U-87) will be studied. They will be treated with various flavonoids at increasing concentrations (10, 20, 40, and 80 μM). Cells will be counted following the trypan blue staining protocol. MTT assays and Western blot analyses will be used to assess cell proliferation. Cell death will be assessed with flow analyses and Western blot analyses. Unpaired t-tests will be run to compare treated and control cells at a 95% confidence interval. If necessary, one-way ANOVA with multiple comparisons will be used to compare multiple treatment groups and a control at a 95% confidence interval, and the Tukey post-hoc test will be utilized if appropriate. All statistical tests will be run in IBM SPSS 21®.			
Gina Mattes	Graduate Student	Pharmacy	Evaluating the Bioavailability of Carbamazepine Using a Novel SNEDDS Formulation	Gina Mattes, Zachary Wallace, Derrick Chapman, Jinwon Byun, Rebecca Kyper, Elisha Injeti
	Effect of Particle Size on Bioavailability of Carbamazepine Administered as a Nanoemulsion. Carbamazepine (CBZ) is an anticonvulsant drug primarily used to treat epilepsy, bipolar disorder, trigeminal and glossopharyngeal neuralgia. CBZ is a lipophilic, poorly soluble drug that belongs to the class-2 category according to the Biopharmaceutics Classification System. As a class-2 drug, the plasma concentration of CBZ is limited by its ability to diffuse across biological membranes. To increase its bioavailability, different methods such as crystal modifications, particle size reduction, amorphization, cyclodextrin complexation, pH modification, and self-emulsification were explored. Of these methods, Self Nano Emulsifying Drug Delivery Systems (SNEDDS) have shown to reduce particle size of CBZ molecules and improve its solubility. However, the bioavailability of CBZ administered as SNEDDS are not yet investigated. Given this background, the current study proposes to evaluate the bioavailability of these novel drug delivery systems using a rat model. The study is designed as a randomized controlled crossover experiment using 10-12 Sprague-Dawley rats divided equally into two groups. For this study, blood samples will be collected at 5, 10, 15, 20, 30, 45, 60, 90, and 120 minutes after administering two different formulations of CBZ nanoemulsions and stored at -20°C until ready for analysis. Plasma concentrations of CBZ will be determined by HPLC method. An unpaired t-test will be used to compare the significance between the two sets of data.			
Julie Cummings	Graduate Student	Pharmacy	The Role of Pharmacists in Primary Care Settings	Julie Cummings, McKenzie Shank, Nathanael Smith, Olumami Amaye, Cara Toms, Thaddeus Franz, Tracy Frame
	"*Introduction*: The profession of pharmacy has evolved from a dispensing role to an interdisciplinary clinical role in patient care. One area of patient care expertise is Medication Therapy Management Services (MTM), which includes services such as pharmacotherapy, medication therapy reviews, disease management, immunizations and other clinical services. Various studies have shown that pharmacists conducting MTM improve patient outcomes in some clinical settings. Amidst the valuable services all health care professionals are providing, increasing medical costs and a lack of primary care physicians have become overwhelming, potentially leading to negative patient outcomes. Gaps in communication between hospital, primary care clinics and community pharmacies also contribute to negative patient outcomes. Pharmacists can help bridge the gap in miscommunication and help improve patient outcomes by working in primary care settings. *Objective*: To determine if the addition of pharmacists providing clinical services (i.e. MTM) in a primary care setting can support the prescribers' patient care demands. *Methods*: The study is an observational, exploratory study. All Federally Qualified Health Centers (FQHCs) in Ohio will be invited to participate. FQHCs are identified from the HRSA Office of Pharmacy Affairs as Consolidated Health Center Programs. IRB approval will be acquired. A Qualtrics survey will be administered via email to the participants that will include a consent form, information about the study and a link to the survey. The survey will include demographic, open-ended and 5-point Likert-type scale (1=strongly agree, 5=strongly disagree) questions. Reliability and validity of the survey will be established by a thorough search of the literature and expert review. Results: Upon approval from the IRB, data will be collected from summer 2014 to summer 2015. Submitted surveys will be analyzed with the appropriate statistical tests in SPSS. Data will be presented in spring of 2016."			

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POSTER PRESENTATIONS *(continued)*

School of Pharmacy *(continued)*

NAME	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Denise Simpson	Faculty	Pharmacy	Effect of Growth Environment on the Bioactivity of Selected Plant Species	Denise Simpson, Keilah Ketron, Erin Tessier, Robert Paris
	Within the pharmaceutical industry there has been an increase in the number of synthetic drug molecules available to treat various conditions. While these synthetic drugs have proven useful, there has been growing public concern about the potentially negative long-term effects of synthetic agents on the body. Therefore, there is an increased interest in using plant extracts and purified compounds as a more natural alternative. The goal of this study was to evaluate the cytotoxicity levels, and specific biological activity and capability of three plant species: Lonicera maackii (amur honeysuckle); Malus sp. 'Adirondack' (crabapple); and Allium vineale (wild garlic). The wild garlic and crabapple species were taken directly from the field for testing. Amur honeysuckle was dug from the field in January, and transplanted indoors under grow lights. These plants were then subjected to three separate treatments: control treatment - water to field capacity with no fertilizer; positive treatment - water to field capacity with fertilizer; and negative treatment - half of the water given to the field capacity treatment with no fertilizer. The rationale for choosing these different treatments was to evaluate the effects of specific growing conditions on the production of bioactive secondary metabolites by these plant species. The biological evaluation included the following assays: brine shrimp – a measure of cytotoxicity, lettuce seed germination – effect on germination and length of radicle, -carotene bleaching, diphenylpicrylhyrazyl (DPPH) free-radical scavenging, and lipase inhibition thin layer chromatography (TLC) bioautographic assays. Results from these experiments indicate that the biological and chemical profiles of the selected plant species were influenced by the environmental conditions under which the plants were grown.			
Rocco Rotello	Faculty	Pharmacy	Are Cell Death Proteins/Antigens Found on Interdigital Cells Dying During Limb Development Expressed in a Simple Organism Such As Tetrahymena?	Rocco Rotello, Jessica Ward, Samuel Franklin, Jenna Lawhead
	Numerous studies have been published that describe the genes and proteins that control cell death in various biological systems including normal embryonic development and in disease such as cancer. We describe attempts to look at a possible conserved cell death antigen in the simple organism Tetrahymena, using a unique monoclonal antibody that recognizes only dying cells in the chick limb. The main impetus for the research is to answer the question; does the cell death process have key proteins that exist in the dying process that can be modulated prior to the completion of the cell death process? Using various stimuli to induce cell death in tetrahymena thermophi a including staurosporine, hypoxia and other know cell death modulators, we describe the preliminary methods used to verify that cells across two species may express conserved cell death proteins at certain times during the death process. The goal is to demonstrate that normal interdigit cell death is an ideal system for isolating programmed cell death antigens and provides a way to identify common mediators/markers in other model systems such as tetrahymena thermophila.			
Rocco Rotello	Faculty	Pharmacy	Monoclonal Antibody Activity in Human Umbilical Endothelial Cells That Possess Opposing Growth Factor Signaling Receptors.	Rocco Rotello, Marissa Cushing, Steve Vetter, Shane Johnson, Jessica Ward
	In various clinical settings such a peripheral vascular disease and diabetes, patients can develop leaky blood vessels that leads to the extravasation of fluid in surrounding tissues, mainly in the lower limbs, ultimately resulting in edema and compromised blood flow. In an attempt to maintain vascular integrity and stability researchers have tried to modulate two key receptors on endothelial cells, Vascular Endothelial Growth Factor Receptor-2 (VEGFR2) and tunica internal endothelial cell kinase 2 (Tie2) receptor using various approaches, including ligand administration and small molecule inhibition of kinase activity on the intracellular part of Tie-2. Various strategies for a therapy include monoclonal antibodies (Mabs) that influence the aforementioned pathways. The current poster describes a monoclonal antibody that binds a cell surface target protein and indirectly modulates the Tie-2 receptor activity.			
Laura Cummings	Graduate Student	Pharmacy	Effectiveness of Clinical Scenarios in Improving Student Interprofessional Skills and Attitudes	Laura Cummings, Ashley Peterson, Mike Pelyhes
	"*Background* "Interprofessional education (IPE) is defined as the process by which individuals from two or more health professions learn with, from, and about each other across the spectrum of their education to improve collaboration, practice, and the quality of health care." [1] Interprofessional education has recently gained interest as an important aspect of training in healthcare professions, attracting the attention and support of several key pharmacy organizations. Various models of IPE have been implemented to facilitate collaboration among health care students and professionals. One model found to be particularly effective among pharmacy students is a mock clinical scenario, requiring interprofessional collaboration in order to yield the best care for the patient. *Objectives* The aim of this project is to utilize mock clinical scenarios to improve interprofessional knowledge, collaboration, student attitudes, and behaviors among Cedarville pharmacy, nursing, and social work students and Wright State medical students. The long-term goal is to integrate this clinical scenario model, if proven effective, into the professional curricula of emerging health science centers. *Methodology* The intervention of this study is a mock clinical scenario for pharmacy, nursing, social work, and medical students. The participants will complete an initial survey to assess baseline interprofessional behaviors and attitudes. The students will then discuss the scenario in intraprofessional groups and determine a plan of action. Following the intraprofessional session an interim survey will be taken to determine any changes in attitudes and behaviors. The subjects will then repeat the activity in interprofessional groups and determine a course of action. Following the interprofessional session a final survey will be administered to measure further change in attitudes and behaviors. Each session will be 20 minutes, and participants will be given five minutes to complete each survey. Analysis Analysis will be conducted with the Kruskall-Wallis test to find change in attitudes among the students among the different majors. Also, the Wilcoxon signed-rank test will determine changes within each group since normal distribution will not be assumed."			

PERFORMANCES

College of Arts and Sciences

PHARMACY	POSITION	DEPARTMENT	ABSTRACT TITLE	ABSTRACT AUTHORS
Sandra Yang	Faculty	Music and Worship	In Royal Company: The History of the Historic Erard Piano	Sandra Yang, Rachel Lowrance
	The acquisition of the 1876 Erard piano by the Department of Music and Worship at Cedarville University, donated anonymously in fall 2013, has provided the Department, especially the piano and music history students, an opportunity to bring history to musical life. After months of meticulous restoration, the piano was unveiled and dedicated at a public presentation earlier this spring. The history of the Erard company has been an important one in the development of nineteenth-century piano repertoire. Famous composers such as Beethoven, Chopin, and Liszt played on Erard pianos. The company furthermore became the official supplier of pianos to many royal figures, from Louis XVI and Marie Antoinette to Queen Victoria. This presentation explains the history of the Erard piano with its technological developments that made it superior to every other piano in the 19th century. Included in the lecture are demonstrations on the Erard itself.			
Simon Yeh	Undergraduate Student	Music and Worship	Jazz Improvisation: Organic Technical Mastery	Simon Yeh
	When one listens to music, there are several facets to the music that give the listener the experience that he is enjoying. Two of the main overarching factors that make up how the music sounds to the listener are its melodic and harmonic structural integrity that make up the piece of music. Each of these factors can change how the music being played reaches the ears of the listener. Of all the genres of music, jazz music places the most responsibility of these factors on the performer. Jazz improvisation is known for the performer coming up with musical ideas in the moment, but every choice the improviser makes is based on what he knows. With that thought in mind, one can see that an improviser that does not have a big spectrum of musical knowledge and technical facility on his instrument and style of music is not completely free to improvise organically. This principle has to be understood before one can understand the topic of this paper. Another idea that has to be understood is that technical facility works hand in hand with organic melodies. Technical facility is the only means to true organic playing. In order to gain the ability to improvise with a complete organic and natural fluidity in any style, one first must have a technical mastery that facilitates much farther than is needed.			
Joy Brammer	Undergraduate Student	Music and Worship	Franz Liszt: Tone Poems	Joy Brammer
	Franz Liszt (1811-1886) was a composer during the late romantic era who was a master at writing tone poems. He had been composing music according to the forms of the classical and early romantic eras, but wanted to take a step further. So he began to create pictures, stories, and poems through his compositions. This is an example of program music. This presentation will discuss Liszt's composition style in his tone poems, and what makes him unique in his writings. I will do an analysis of a particular piano piece "Sonetto 104 del Petrarca." This piece was inspired by a poem written by Francesco Petrarca, who was a poet and scholar of the Renaissance Era. After the analysis, I will performance will be done of this piece, concluding the presentation.			


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